

INDUSTRY 4.0

SMALL MEDIUM ENTERPRISE (SME)
SMALL & WINNING BIG STRATEGY

15 June 2017

INDUSTRY 4.0

(Leadership By Data)



Simulation & Augmented Reality



Horizontal and Vertical Integration



Industrial Internet of Things



Cybersecurity



Cloud



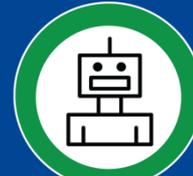
Additive Manufacturing



Supply Chain



Big Data Analytics



Autonomous Robot



KEY TAKEAWAYS

1. What will change?
2. Why we need it?
3. What are the key challenges?
4. How to manage changes?



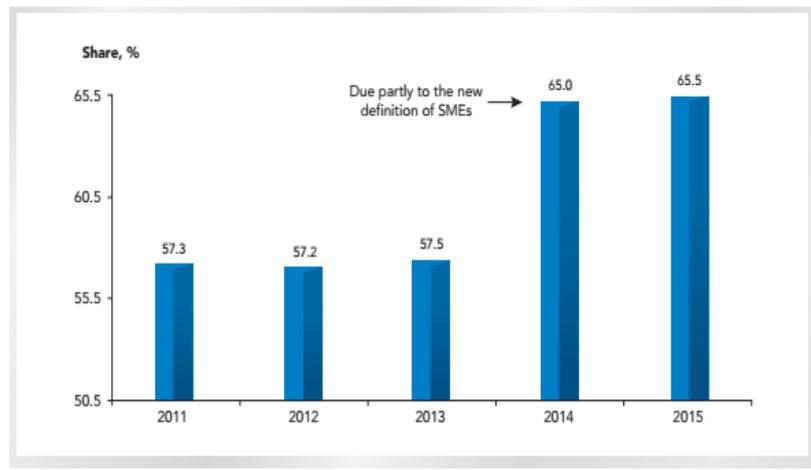
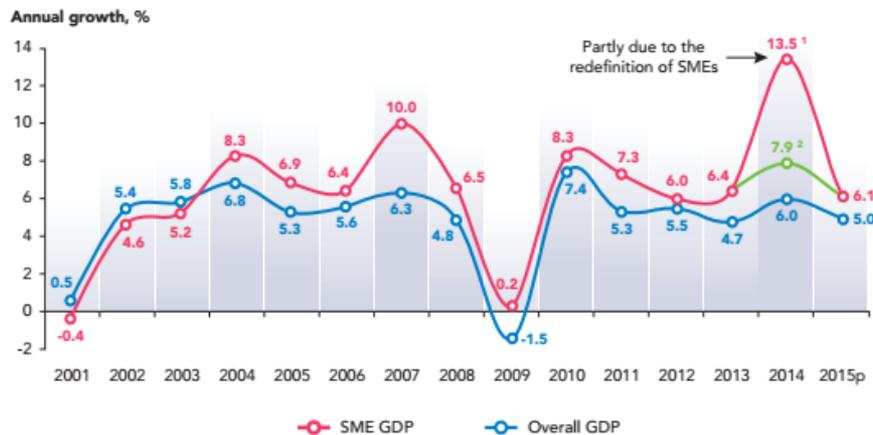
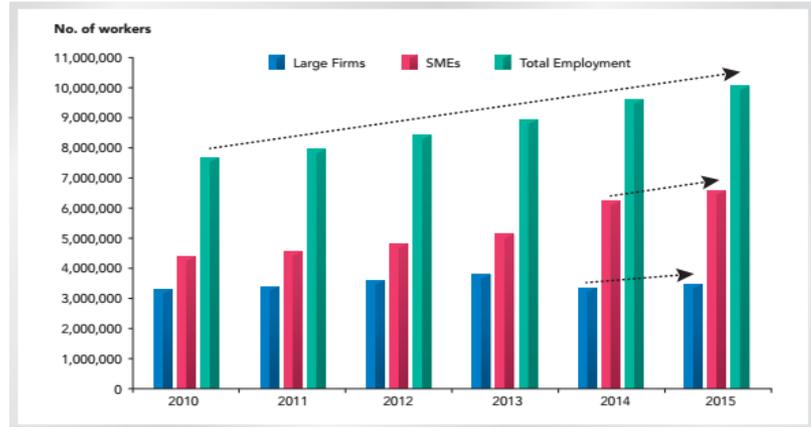
What will change?

SMEs: LOOK AT OUR STRENGTH



- SME's contributed > 35% to National GDP growth
- Employment share > 65% of the overall nationwide total workforce
- Contributed > 17% of the overall nationwide export

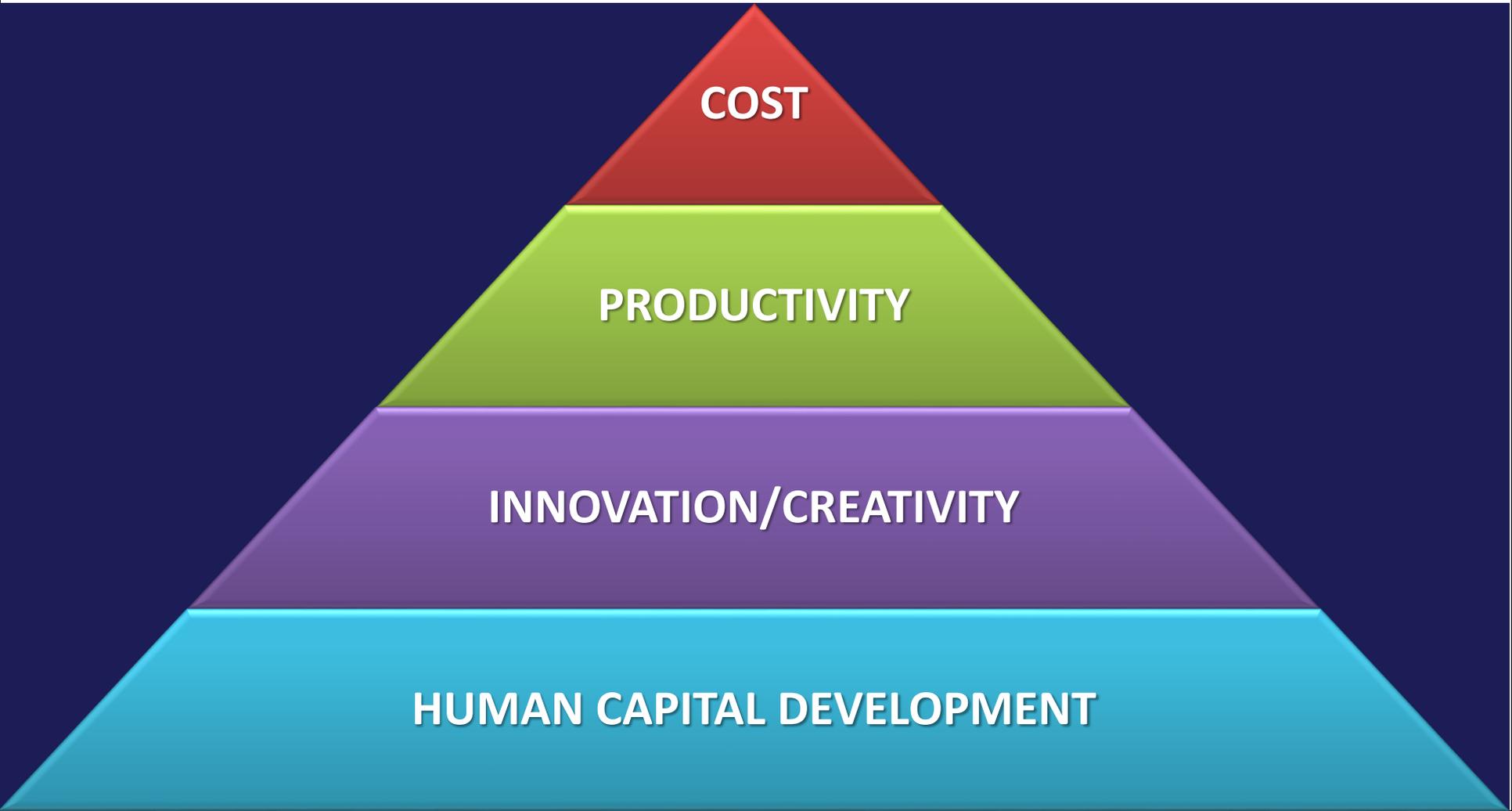
	SME Contribution to GDP			SME GDP Growth
	2010 (% share)	2015 (% share)	Increase / decrease in share	CAGR ¹ 2011 - 2015 (%)
Overall²	32.2	36.3	+4.1	6.7
Construction	0.9	2.1	+1.2	10.9
Services	19.6	21.4	+1.8	7.1
Mining & Quarrying	0.05	0.2	+0.15	9.3
Agriculture	4.3	4.3	0.0	2.9
Manufacturing	7.2	7.9	+0.7	6.7



SMEs: LOOK AT OUR CHALLENGES



- Increase Sales & market share
- Maximize Profitability



New opportunities in Industry 4.0



INDUSTRY 4.0: WHY WE NEED IT?

Cost

- Eliminate waste & losses
- Eliminate human dependency
- Increase productivity

Complexity

- Sub-Nano technology
- Global Digitalization
- Exponential technologies

- Mass personalization
- Fast, Cheap, Quality
- Customer drive for change

Customer

Competition

- Increase sales
- Increase competitiveness
- Increase market share





iPhone manufacturer Foxconn plans to replace almost every human worker with robots

*FOXCONN PRODUCES 10,000
FOXBOTS A YEAR FOR
AUTOMATION PURPOSES*

*FOXCONN HOPES TO AUTOMATE
30 PERCENT OF ALL FACTORY
WORK BY 2020*

Foxconn replaces '60,000 factory workers with robots'

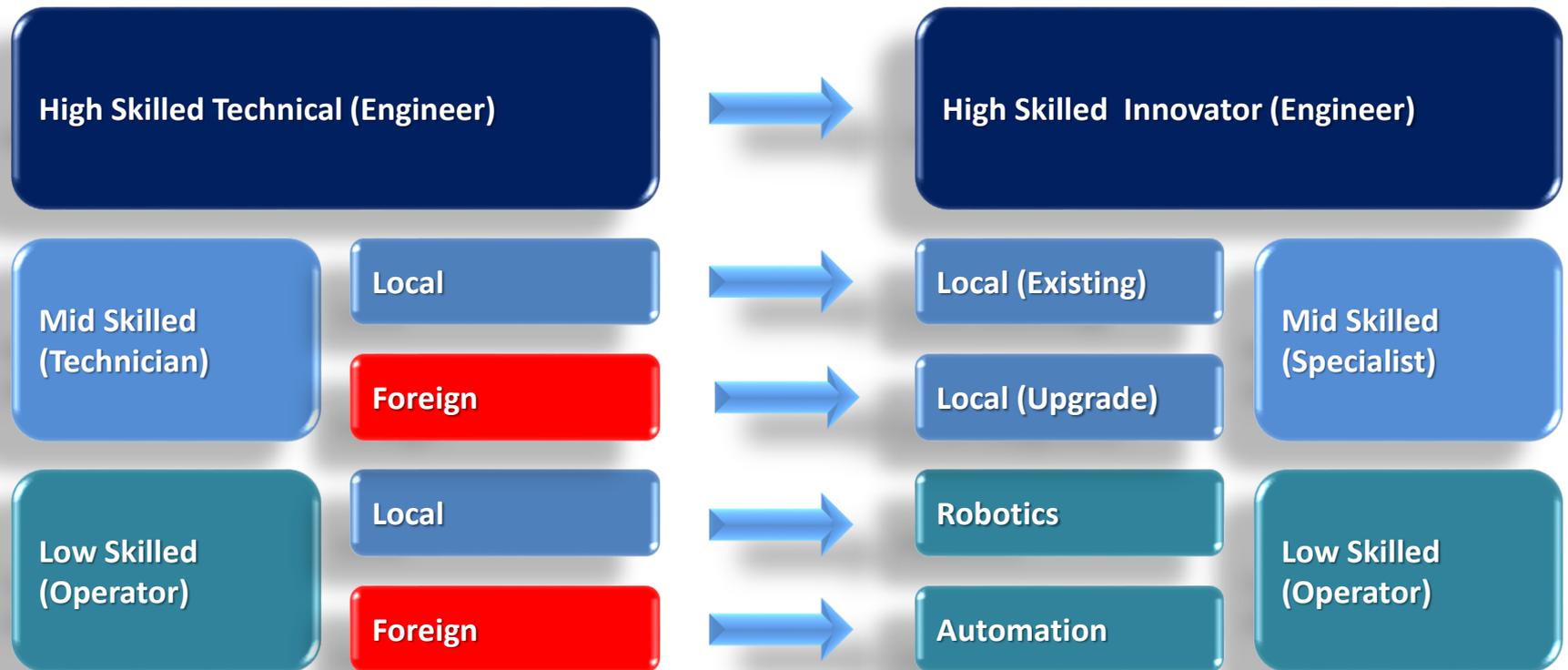
"We are applying robotics engineering and other innovative manufacturing technologies to replace repetitive tasks previously done by employees, and through training, also enable our employees to focus on higher value-added elements in the manufacturing process, such as research and development, process control and quality control.

INDUSTRY 4.0: WORKFORCE TRANSFORMATION



CURRENT

INDUSTRY 4.0



- Industry 4.0 will eliminate our dependency on Foreign labour workforce
- Industry 4.0 will provide platform for job/skill upgrade for existing local workforce

I4.0... Goal, Mission or Tools?

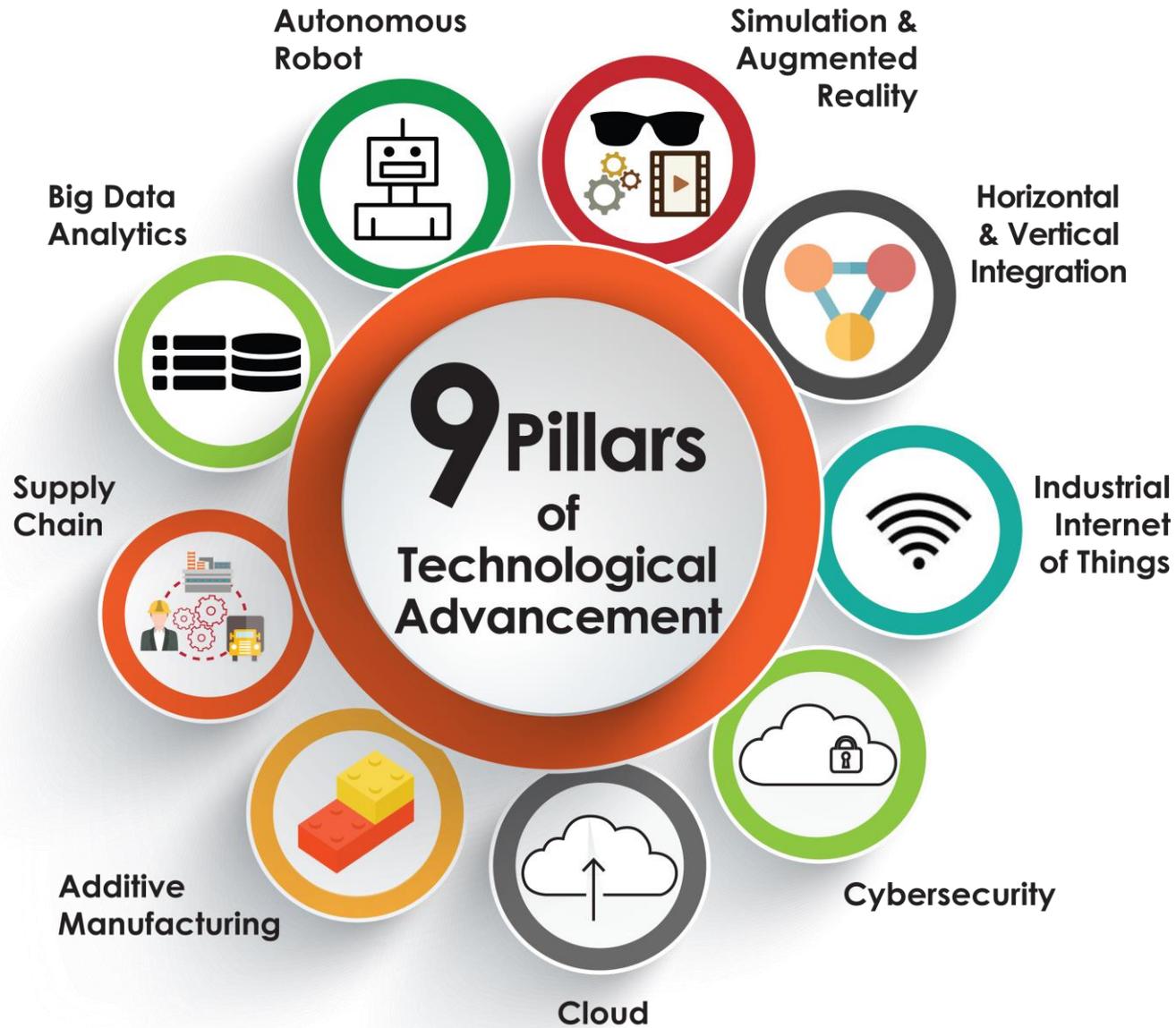
Industry 4.0 is the current trend of *digital data exchange & automation* through *Cyber Physical System* in manufacturing technologies.



- ✓ Digital data exchange
- ✓ Automation
- ✓ Cyber Physical System (CPS)



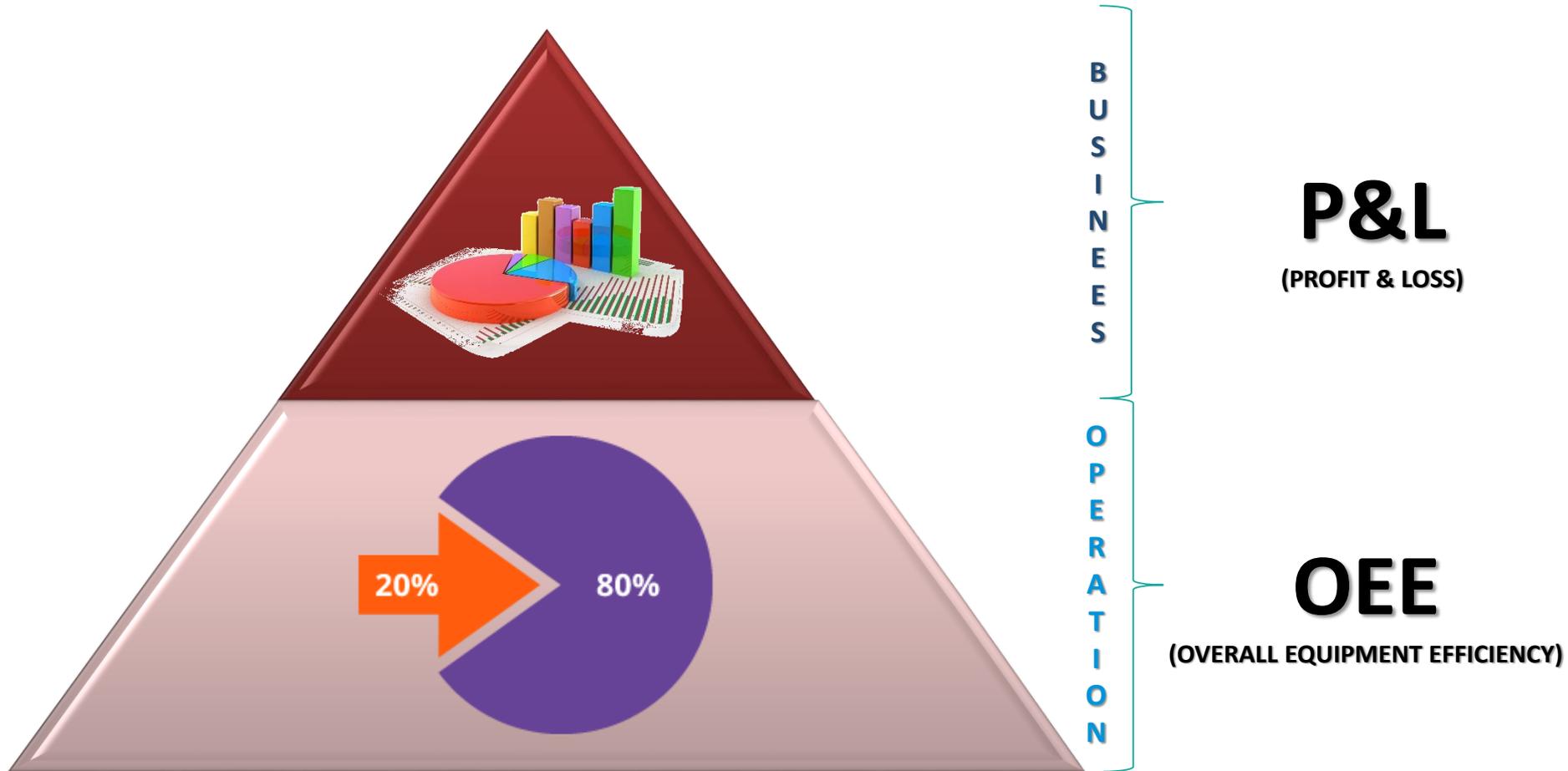
9 Technological Pillars



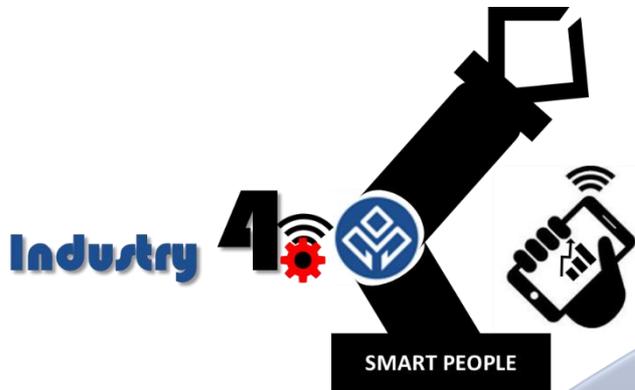
How to start?



KICK STARTING THE PROGRAM: WHERE DO WE BEGIN?



THE INDUSTRY 4.0: 1st STEP



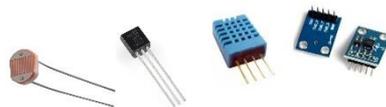
Assign all "THINGS" a name

- Products & Material with ID (Barcode, Unique name)
- Real-time scan, track & trace



Measurements

- Process & Sensor data
- Across value chain & multiple points
- Production & Products
- Improve process time, quality and reduce cost



Connect & Analyse

- Products & digital specifications
- Production materials & process data
- Data exchange & interconnectivity
- Analyse data real-time
- Initial steps towards BIG Data



GOALS: PRODUCTIVITY & BUSINESS RESULTS



PRODUCTIVITY TOOLS



TECHNOLOGY TOOLS



INDUSTRY 4.0 PRINCIPLES



ARPOACH/ MISSION



VISION/ GOALS



- Productivity tools & 9 pillars technology tools convergence master plan
- Establishment of tangible KPI's
- Technology tools from the 9 pillars as part of the productivity tools

Key Challenges

**NEW EQUIPMENTS
COST
INVESTMENT
ROI ???**

UPGRADING PSDC LABS TO 14.0:



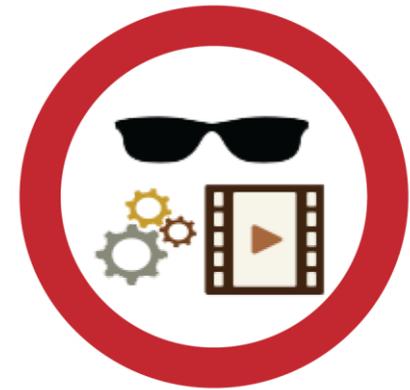
OLD MACHINERY



Cloud



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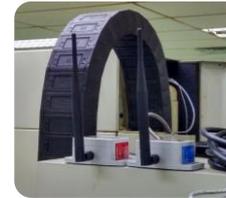
Cybersecurity

UPGRADING PSDC LABS TO 14.0:

OLD MACHINERY – HARDWARE/SOFTWARE UPGRADE



**DATA ACQUISITION
SYSTEM HARDWARE
UPGRADE**



**WIRELESS DATA
TRANSFER TO CLOUD**



Sensors



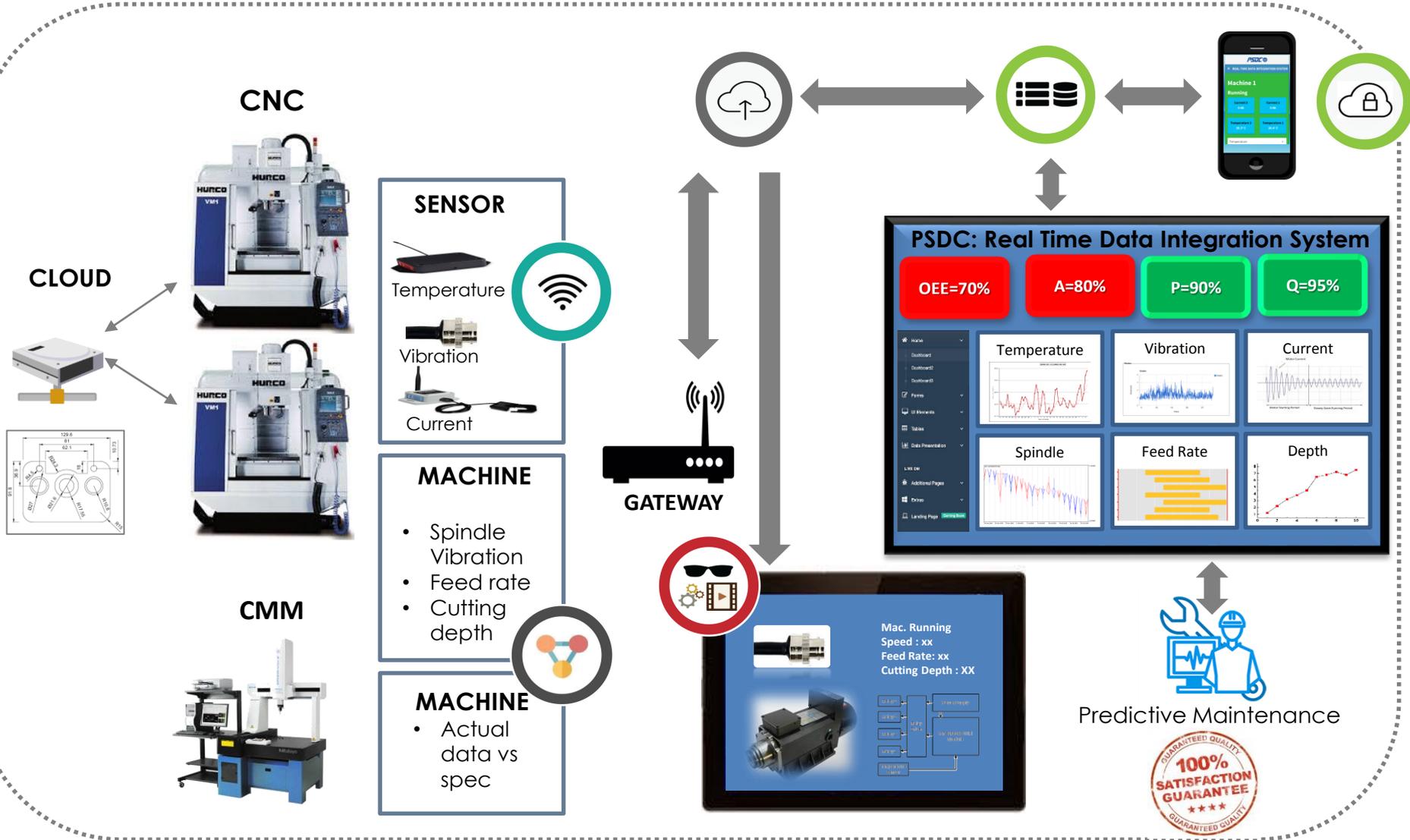
**INTEGRATION OF
MACHINE PROGRAM**



UPGRADING PSDC LABS TO 14.0:



OLD MACHINERY



Machine 1 Running

OEE %



62.0

Actual OEE :	80
Machine Name :	Hurco VM10

AVAILABILITY



71.0

Planned Production Time :	14 Hours
Running Time :	10 Hours

PERFORMANCE



89.0

Ideal Run Rate :	10 unit/hours
Produce Units :	89

QUALITY



98.0

Good Units :	89
Rejected Units :	1

- Machine Status
- Machine Health
- Data Log
- Setting
- User Management

Machines Health

MACHINE 1

Machine Condition



Good

Temperature :	30.8 °C
Current :	0.23 Ah
Vibration :	Good

MACHINE 2

Machine Condition



OFF

Temperature :	0
Current :	0
Vibration :	0

MACHINE 3

Machine Condition



OFF

Temperature :	0
Current :	0
Vibration :	0

MACHINE 4

Machine Condition



OFF

Temperature :	0
Current :	0
Vibration :	0



Machine 1 Running

Current 2

0 Ah

Current 1

0 Ah

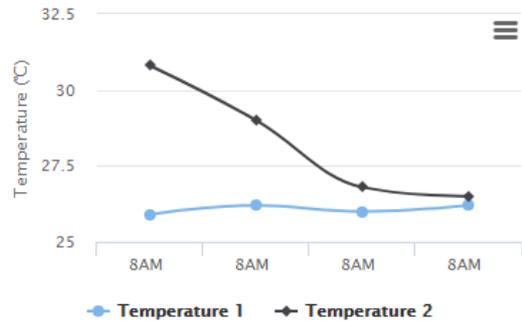
Temperature 2

25.2° C

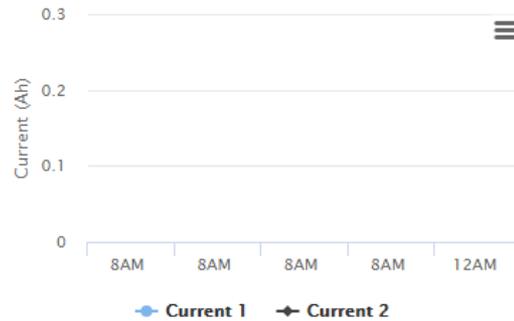
Temperature 1

25.2° C

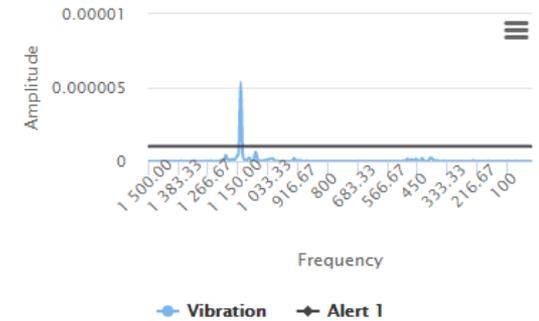
Temperature



Machine Current



Vibration

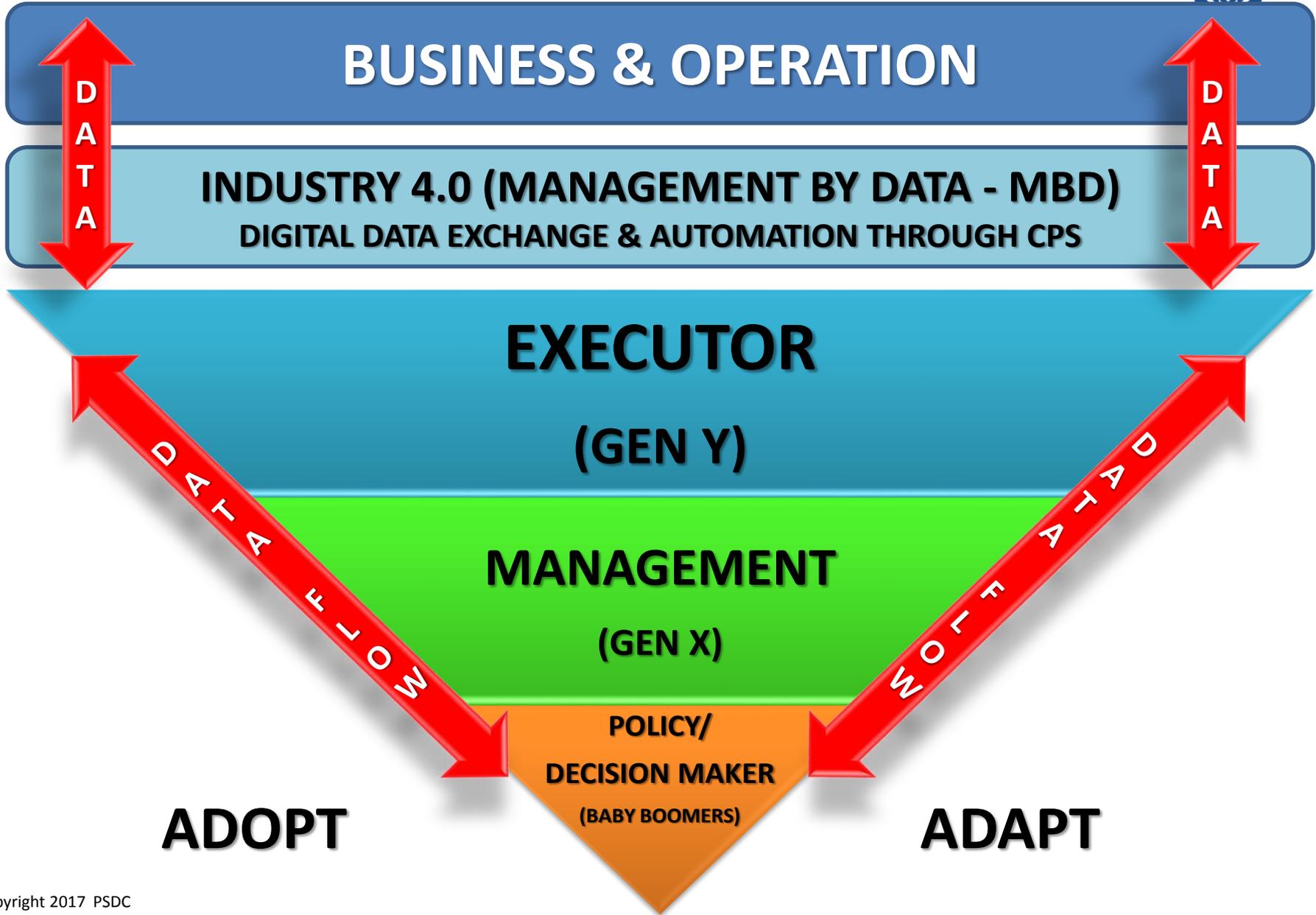


Spindle

Feed Rate

Management/Leadership By Data?

MULTI-GENERATIONAL LEADERSHIP HEIRACHY



INDUSTRY 4.0: R&R



CURRENT

INDUSTRY 4.0

OPERATION

+

IT

- Fire fighting
- Manual data tracking & analysis
- Manual recording
- Reactive problem solving
- Human dependant operation
- **Just focus on IT**
- **Outsourced to 3rd party**
- **CLOUD adoption**
- **General IT**

- Data driven
- BIG Data & auto analysis
- Electronics data pull
- Proactive problem solving
- Autonomous machineries
- **Need to know operation**
- **In house expertise**
- **CLOUD and integration to IIoT**
- **System integrator (S/H/SI)**

+

COMMON

- Centralisation
- Lack of operation knowledge
- Fragmented system
- Too much of paperwork
- Document for compliance

- Cross functional
- Must well verse with operation
- Integrated system
- Electronics based system
- Auto reporting for compliance

+

MANAGEMENT

TEAM

- **MBO (Management By Obj.)**
- **On site, Remote**
- **Micro & Macro Managing**
- **TRUST on PEOPLE**

- **MBD (Management By Data)**
- **Virtual but Visible**
- **SMART Management**
- **TRUST on DATA**

▪ **MINIMUMLY – HYBRID COMPETENCY LEVEL**



Thank You

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